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USER'S MANUAL FOR THE MACINTOSH VERSION OF PASCO

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1. Introduction:

Macintosh PASCO is a version of the Panel Analysis and Sizing Code (PASCO)¹ modified for use on the Apple² Macintosh II class computers. PASCO is a computer code which combines a rigorous buckling analysis with a non-linear mathematical optimization routine to perform structural analysis and least-mass optimization of longitudinally-stiffened composite panels. PASCO is restricted to prismatic structures having an arbitrary cross-section. The panel can be loaded by any combination of in-plane loads and lateral pressure, and can include an initial "bow-type" imperfection.

Like mainframe computer versions of PASCO, Macintosh PASCO inputs ASCII (i.e., text) files which contain the traditional PASCO input format. As output, Macintosh PASCO produces a text file containing panel analysis details and graphic files in PICT format containing plotted results. PICT files are a standard Macintosh method of storing graphical information.

This user's manual documents the user interface for Macintosh PASCO. Details about the PASCO code itself are found in references 1 and 2. In addition, an interactive graphic interface called MacPASCO has been developed for the Macintosh. By using a graphical user interface, MacPASCO simplifies the specification of panel geometry and reduces user input errors. MacPASCO is discussed in reference 3.

Glossary

The glossary below defines terms used throughout this user's manual. Most of these terms find common use for discussions of the Apple Macintosh computer's user interface.

button	A button is a small screen object, usually labeled with text. The user clicks on a button to cause the computer to perform an action.
check box	A check box represents an option that is either on or off. The user clicks on the check box to toggle the option.
click	To position the cursor on the computer screen, and then to press and quickly release the mouse button.
cursor	A small shape on the screen that follows the movement of the mouse.
dialog box	A display window which prompts the user for input. A dialog box remains on the screen until the user dismisses it, usually by clicking on a button-shaped object within the dialog box display.
double click	To click the mouse twice in rapid succession without moving the mouse between clicks.
drag	To position the cursor on the screen, press and hold the mouse button down, move the cursor with the mouse button down to a new location on the screen, and release the mouse button.

¹ See references 1 and 2

² Apple and Macintosh are registered trademarks of Apple Computer Inc.

- mouse** Generic term for any hand-operated interface device that controls the location of the cursor on the computer screen. The mouse has a button which is pressed by the user, usually to signal the computer to initiate some action.
- point** To use the mouse to indicate a location on the screen.

2. Hardware Requirements:

The following are required to use Macintosh PASCO:

- A Macintosh II class machine (II, IIx, IIcx, IIci, or IIfx).
- At least 2MB RAM.

Macintosh PASCO is distributed on a single floppy disk containing 2 files: the Macintosh PASCO application, and a folder which contains example input and output. To install Macintosh PASCO on a hard disk, simply copy the Macintosh PASCO application and the example folder from the floppy disk.

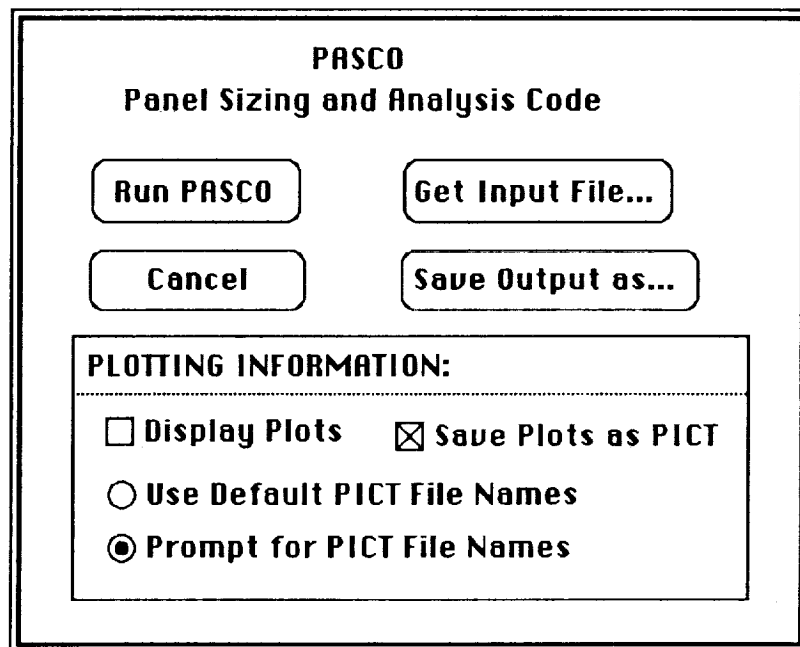
3. Macintosh PASCO Input Files:

Macintosh PASCO accepts text files (ASCII format) which use the traditional PASCO input format, as described in reference 1.

Input files can be created on the Macintosh by a variety of word processors which can save files as text only (ASCII format). Input files for the test cases were created in Microsoft WORDTM using the WORD file format option *text only with line breaks*.

4. Running Macintosh PASCO:

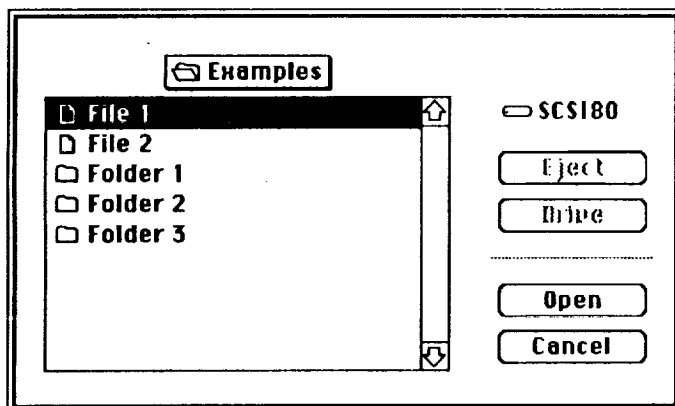
Double-click on the Macintosh PASCO icon to start the program. The Macintosh PASCO start-up dialog box appears, as shown below:



The rest of section 4 discusses the use of this dialog box.

4.1 **Get Input File...**

Click on the **Get Input File...** button in the Macintosh PASCO start-up dialog box to supply Macintosh PASCO with an input file. A standard Macintosh file dialog box appears, as shown below:



1. The dialog box contains a scrollable list of files. The list only displays files and folders within a single folder at a time. The name of the current folder appears above the

scrollable list. Initially only the files in the same folder as the Macintosh PASCO application are displayed.

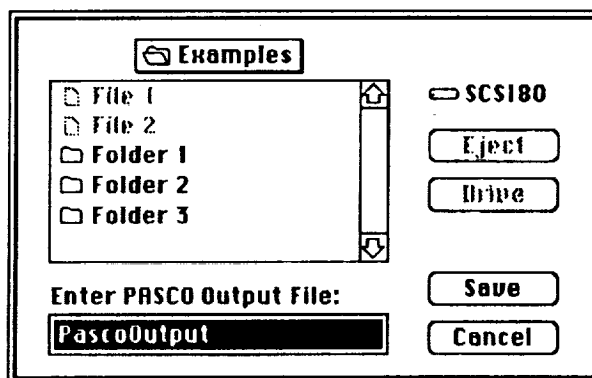
2. Choose the desired input file from the scrollable list by pointing, then clicking on the button labeled "open."
3. If the input file does not appear in the current folder, switch folders. Double-clicking on a folder displayed in the scrollable list makes that folder the new current folder. Alternatively, clicking on the current folder name (above the scrollable list) and keeping the mouse button down displays the current folder's location on the disk. The current folder appears at the top of the display, followed by the folder that contains the current folder, and so on with the hard disk at the bottom of the list. Dragging the mouse to select a folder or disk in this list and releasing the mouse button makes the selected folder the new current folder.

In the case of multiple clicks on the **Get Input File...** button, the last file chosen becomes the input file.

4.2 **Save Output as...**

Click on the **Save Output as...** button in the Macintosh PASCO start-up dialog box to save Macintosh PASCO output in a file. A standard Apple file dialog box appears as shown below:

To specify an output file name, type the desired file name and click on the "Save" button or type a carriage return.



The output file contains the results of Macintosh PASCO analysis. The file is saved as a TEXT file which can be opened from a variety of word processors. See the section on "Examining the Output" for further details.

4.3 **Cancel**

Click on the **Cancel** button in the Macintosh PASCO start-up dialog box to halt Macintosh PASCO execution.

4.4 **Run PASCO**

Click on the **Run PASCO** button in the Macintosh PASCO start-up dialog box to start Macintosh PASCO analysis of the selected input file.

1. Macintosh PASCO does not execute if an input file has not been selected. A warning message appears instead.
2. Macintosh PASCO does not execute if an output file has not been selected. A warning message appears instead.

4.5 ☐ **Display Plots**

Click on the **Display Plots** check box in the Macintosh PASCO start-up dialog box and plots are displayed on the screen, one at a time, as they are created.

1. Plots are displayed too quickly to be inspected unless **Prompt for PICT File Names** is selected (see section 4.7).
2. By default, the command **Display Plots** is off.

4.6 ☐ **Save Plots as PICT**

Click on the **Save Plots as PICT** check box in the Macintosh PASCO start-up dialog box to save plots generated by Macintosh PASCO.

1. Plots are saved as PICT files. PICT files are a standard Macintosh method of storing graphical information. There are two options for selecting the plot file names (see sections 4.7 and 4.8). See the section on "Examining the Output" for further details on how the plots can be examined and printed.
2. By default, the command **Save Plots as PICT** is on.

4.7 ☒ **Prompt for PICT File Names**

Click on the **Prompt for PICT File Names** button in the Macintosh PASCO start-up dialog box, and Macintosh PASCO prompts for each plot file name.

1. If plots are being displayed using the **Display Plots** option (section 4.5), then the plot display remains on the screen until given a file name.
2. If a plot file already exists, the following options are displayed and one is chosen: overwrite the existing file or rename the plot file being saved.
3. By default, the command **Prompt for PICT File Names** is turned on.

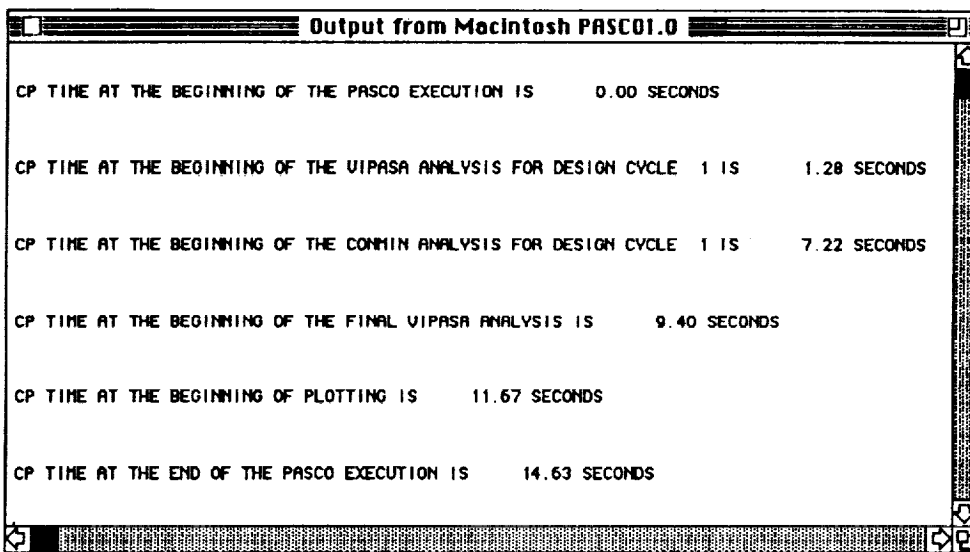
4.8 ☉ Use Default PICT File Names

Click on the **Use Default PICT File Names** in the Macintosh PASCO start-up dialog box, and prompts for plot file names do not appear; default names are used instead.

1. Default plot file names depend on the output file name selected by the user (using the **Save Output As...** button). By default, plot file names consist of the output file name suffixed with .PICT followed by a number. For example, if the user's output file is PASCOOutput, the first plot file name is PASCOOutput.PICT1, the second plot file name is PASCOOutput.PICT2 and so on. Plot files are placed in the same folder as the user's output file.
2. If the default plot files already exist on the disk, **THEY ARE OVERWRITTEN WITHOUT WARNING.**
3. By default, the command **Use Default PICT File Names** is off.

5. While Macintosh PASCO is Running

During its execution, Macintosh PASCO displays a window containing a mini progress report. The progress report indicates the stage of analysis being performed and lists CPU times. A sample window is shown below:



When Macintosh PASCO's analysis is complete, the progress report window remains visible, and a menu bar appears containing a "File" menu, an "Edit" menu and a "Fonts" menu. The "File" menu is shown below:

File	
Close	⌘W
Save As...	⌘S
Save Selection As...	
<hr/>	
Page Setup...	
Print...	⌘P
Print Selection...	
Rerun Program	⌘R
Quit	⌘Q

- To print the progress report, click on the "File" menu item and choose **Print**.
- To save the progress report, click on the "File" menu item and choose **Save as...**. A dialog box prompts for the file name.
- To end a user session with Macintosh PASCO after Macintosh PASCO's analysis is complete, click on the "File" menu item and choose **Close** or **Quit**. Alternatively, click on the close window box.

Macintosh PASCO and Multifinder

Multifinder is an Apple Macintosh feature that allows several applications to execute at once. Macintosh PASCO executes under multifinder, if sufficient memory is available. However, at present each individual Macintosh application is responsible for giving other applications a chance to use the CPU. Although Macintosh PASCO runs using multifinder, Macintosh PASCO does not give other applications a chance to use the CPU, so other applications cannot execute while Macintosh PASCO runs.

6. Examining the Output

Macintosh PASCO produces two pieces of output: a text file containing analysis details and plots stored as PICT files.

6.1 Text Output

- The text file output can be examined and printed using most word processing applications. Simply "open" the text file output from within the word processor application; usually this is done by selecting the "open" command from the application's "file" menu.
- Macintosh PASCO's output is the same as that from a mainframe version of PASCO which was designed for wide paper printers. As a result, the page margins must

be adjusted from within the word processor application. Also, the word processing application's menu option **Page Setup...** can be used to print the text file horizontally rather than vertically. Experiment with the actual word processor to determine the combination of font settings, page setup, margins and so forth that are best.

6.2 Plot File Output

- The plot files can be examined and printed from applications which accept standard PICT files. Macintosh PASCO plot files have been opened and printed from within three common Macintosh drawing programs, MacDrawTM, SuperPaintTM, and Cricket DrawTM.
- Some Macintosh applications cannot open PICT files, but allow PICT files to be "placed" as graphics. For example, Macintosh PASCO plot files have been input to Cricket PresentsTM, an application for the creation of visual presentations.
- Currently, the only way to print and examine Macintosh PASCO plot files is from within another application which accepts PICT files.

7. Summary

This manual documents the user interface for Macintosh PASCO, an Apple Macintosh version of the Panel Analysis and Sizing Code (PASCO)¹. The manual provides the information required for an experienced PASCO user to use the Macintosh version of PASCO.

8. References

1. Anderson, M.S.; Stroud, W. J.; Durling, B.J.; and Hennessy, K.W.: PASCO: Structural Panel Analysis and Sizing Code, User's Manual. NASA Technical Memorandum 80182, November 1981.
2. Stroud, W.J.; and Anderson, M.S.: PASCO: Structural Panel Analysis and Sizing Code, Capability and Analytical Foundations. NASA Technical Memorandum 80801, November 1981.
3. Lucas, S.H.; and Davis, Randall C.: User's Manual for MacPASCO. NASA Technical Memorandum 104122, 1991.



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